

Notice of Allowability

Application No.

10/698,660

Examiner

Esaw T. Abraham

Applicant(s)

BURD, GREGORY

Art Unit

2133

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the transmittal New application filed on 11/03/03.
2. ☒ The allowed claim(s) is/are 1-124.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 10/03 and 11/04
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


GUY LAMARRE
PRIMARY EXAMINER

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and or additions be acceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no latter than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Damian Aquino on 08/4/2006.

2. The application has been amended as follows:

As per claims 61 and 78 :

Line, 1 please replace the phrase "A computer program to configure a general purpose computer" to ---A computer program stored on a computer readable media---

Examiner's statement for reason for allowance

3. Claims **1-124** have been allowed.

The following is an examiner's statement for allowance:

As per claim 1:

The prior art, McClellan (U.S. PN: 6,735,724) of record teach a method of estimation of the bit error rate (BER) of a Viterbi detector by estimating the distribution of the margin between two path metrics entering each state that lies along the maximum likelihood path through the trellis (see col. 2, lines 20-24). McClellan further in figure 5 teaches a FIR filter coupled to a Viterbi detector (125) wherein the Viterbi detector comprising branch metric units (521) and

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ACS units (523) for computing path metrics and the Viterbi detector coupled to a decoder (127) and error correction unit (129). However, the prior art taken singly or in combination fail to teach, anticipate, suggest, or render obvious a finite impulse response (FIR) filter to equalize the data primary target; a Viterbi-like detector matched to the primary target and to generate a most likely path corresponding to the data in the input signal; a linear post-processor matched to one of the primary target and a secondary target, and to determine at least one most likely error event in the most likely path, the linear post-processor to generate revised paths based on the at least one most likely error event; and a media noise processor matched to the secondary target and to each of the revised to compute path metrics corresponding paths as a function of a non-linear noise model and to select one of the revised paths based on the path metrics, the secondary target having at least one parameter the first target different than the first target. Consequently, claim 1 is allowed over the prior art.

Claims **2-17 and 121**, which is/are directly or indirectly dependent/s of claim 1 are also allowable over the prior art of record.

As per claim 18:

The prior art, McClellan (U.S. PN: 6,735,724) of record teach a method of estimation of the bit error rate (BER) of a Viterbi detector by estimating the distribution of the margin between two path metrics entering each state that lies along the maximum likelihood path through the trellis (see col. 2, lines 20-24). McClellan further in figure 5 teaches a FIR filter coupled to a Viterbi detector (125) wherein the Viterbi detector comprising branch metric units (521) and ACS units (523) for computing path metrics and the Viterbi detector coupled to a decoder (127) and error correction unit (129). However, the prior art taken singly or in combination fail to

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teach, anticipate, suggest, or render obvious a finite impulse response (FIR) filter to equalize the data primary target; a Viterbi-like detector matched to the primary target and to generate a most likely path corresponding to the data in the input signal; a channel response estimator to track a secondary target, the secondary target having at least one parameter different than the primary target; and a linear post-processor matched to one of the primary target and the secondary target and to determine at least one most likely error event the most likely path, the linear post-processor to generate revised paths based on the at least one most likely error event, the linear post-processor to compute path metrics corresponding to each of the revised paths and the linear response, and to select one of the revised paths based on the path metrics function of the most likely path. Consequently, claim 18 is allowed over the prior art.

Claims 19-30, which is/are directly or indirectly dependent/s of claim 18 are also allowable over the prior art of record.

As per claim 31:

The prior art, McClellan (U.S. PN: 6,735,724) of record teach a method of estimation of the bit error rate (BER) of a Viterbi detector by estimating the distribution of the margin between two path metrics entering each state that lies along the maximum likelihood path through the trellis (see col. 2, lines 20-24). McClellan further in figure 5 teaches a FIR filter coupled to a Viterbi detector (125) wherein the Viterbi detector comprising branch metric units (521) and ACS units (523) for computing path metrics and the Viterbi detector coupled to a decoder (127) and error correction unit (129). However, the prior art taken singly or in combination fail to teach, anticipate, suggest, or render obvious means for filtering to equalize the data to a primary target; means for detecting matched to the primary target and to to the data in the generate a most

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likely input signal; path corresponding means for post-processing matched to one of the primary target and a secondary target, and determine at least one most likely error event in the most likely path, the means for post-processing to generate revised paths based on the at least one most likely error event; means for operating on the data being matched to the secondary target, the means for operating to compute path metrics corresponding to each of the revised paths as function a non-linear noise model and to select one of the revised paths based on the path metrics, the secondary target having at least one parameter different than the primary target. Consequently, claim 31 is allowed over the prior art.

Claims **32-47 and 122**, which is/are directly or indirectly dependent/s of claim 31 are also allowable over the prior art of record.

As per claim 48:

The prior art, McClellan (U.S. PN: 6,735,724) of record teach a method of estimation of the bit error rate (BER) of a Viterbi detector by estimating the distribution of the margin between two path metrics entering each state that lies along the maximum likelihood path through the trellis (see col. 2, lines 20-24). McClellan further in figure 5 teaches a FIR filter coupled to a Viterbi detector (125) wherein the Viterbi detector comprising branch metric units (521) and ACS units (523) for computing path metrics and the Viterbi detector coupled to a decoder (127) and error correction unit (129). However, the prior art taken singly or in combination fail to teach, anticipate, suggest, or render obvious means for filtering to equalize the data to a primary target; means for detecting to generate a most likely path corresponding to the data the input signal, the detecting means matched to the primary target; means for estimating to track a secondary target, the secondary target having at least one parameter different than the primary

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target; and means for post-processing matched to one of the primary target and the secondary target, to determine at least one most likely error event in the most likely path, and to generate revised paths based on the at least one most likely error event, the means for post-processing to compute path metrics corresponding to each of the revised paths as a function of the most likely path and the linear response, and to select one the revised paths based on the path metrics.

Consequently, claim 48 is allowed over the prior art.

Claims 49-59 which is/are directly or indirectly dependent/s of claim 48 are also allowable over the prior art of record.

As per claim 61:

The prior art, McClellan (U.S. PN: 6,735,724) of record teach a method of estimation of the bit error rate (BER) of a Viterbi detector by estimating the distribution of the margin between two path metrics entering each state that lies along the maximum likelihood path through the trellis (see col. 2, lines 20-24). McClellan further in figure 5 teaches a FIR filter coupled to a Viterbi detector (125) wherein the Viterbi detector comprising branch metric units (521) and ACS units (523) for computing path metrics and the Viterbi detector coupled to a decoder (127) and error correction unit (129). However, the prior art taken singly or in combination fail to teach, anticipate, suggest, or render obvious equalizing the data to a primary target; matching a Viterbi-like detector to the using the Viterbi-like detector primary target; to detect data in the input signal to generate a most likely path corresponding the data; generating a most likely path corresponding to the data in the input signal; matching a linear post-processor to one the primary target and a secondary target wherein the secondary target has least one parameter different than the primary target; using the linear post-processor to determine at least one most likely error

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event generating revised likely error event; paths based on the at least one most the most likely path; matching a media noise processor to the secondary target; using the media noise processor to operate on the data; computing path metrics corresponding to each of the revised paths as a function of a non-linear noise model; and selecting one of the revised paths based on the path metrics. Consequently, claim 61 is allowed over the prior art.

Claims **62-77, 85-86 and 123** which is/are directly or indirectly dependent/s of claim 61 are also allowable over the prior art of record.

As per claim 78:

The prior art, McClellan (U.S. PN: 6,735,724) of record teach a method of estimation of the bit error rate (BER) of a Viterbi detector by estimating the distribution of the margin between two path metrics entering each state that lies along the maximum likelihood path through the trellis (see col. 2, lines 20-24). McClellan further in figure 5 teaches a FIR filter coupled to a Viterbi detector (125) wherein the Viterbi detector comprising branch metric units (521) and ACS units (523) for computing path metrics and the Viterbi detector coupled to a decoder (127) and error correction unit (129). However, the prior art taken singly or in combination fail to teach, anticipate, suggest, or render obvious equalizing the data to a primary target; matching a Viterbi-like detector to the primary target; using the Viterbi-like detector to detect data in the input signal; generating a most likely path corresponding to the data the input signal; estimating a secondary target, the secondary target having at least one parameter different than the primary target; matching a linear post-processor to one the primary target and the secondary target; using the linear post-processor to operate on the data and determine at least one most likely error event

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in the most likely path; generating revised paths based on the at least one most likely error event; Consequently, claim 78 is allowed over the prior art.

Claims 79-90 which is/are directly or indirectly dependent/s of claim 78 are also allowable over the prior art of record.

As per claim 91:

The prior art, McClellan (U.S. PN: 6,735,724) of record teach a method of estimation of the bit error rate (BER) of a Viterbi detector by estimating the distribution of the margin between two path metrics entering each state that lies along the maximum likelihood path through the trellis (see col. 2, lines 20-24). McClellan further in figure 5 teaches a FIR filter coupled to a Viterbi detector (125) wherein the Viterbi detector comprising branch metric units (521) and ACS units (523) for computing path metrics and the Viterbi detector coupled to a decoder (127) and error correction unit (129). However, the prior art taken singly or in combination fail to teach, anticipate, suggest, or render obvious equalizing the data to a primary target; matching a Viterbi-like detector to the primary target; using the Viterbi-like detector to detect data in the input signal to generate a most likely path corresponding to the data; generating a most likely path corresponding to the data in the input signal; matching a linear post-processor to one of the primary target and a secondary target wherein the secondary target has at least one parameter different than the primary target; using the linear post-processor to determine at least one most likely error event in the most likely path; generating revised paths based on the at least one most likely error event; matching a media noise processor to the secondary target; noise processor to operate on the data; computing path metrics corresponding to each of the revised paths as a

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function of a non-linear noise model; and selecting one of the revised paths based on the path metrics using the media

Consequently, claim 91 is allowed over the prior art.

Claims **92-107, 115-116 and 124** which is/are directly or indirectly dependent/s of claim 91 are also allowable over the prior art of record.

As per claim 108:

The prior art, McClellan (U.S. PN: 6,735,724) of record teach a method of estimation of the bit error rate (BER) of a Viterbi detector by estimating the distribution of the margin between two path metrics entering each state that lies along the maximum likelihood path through the trellis (see col. 2, lines 20-24). McClellan further in figure 5 teaches a FIR filter coupled to a Viterbi detector (125) wherein the Viterbi detector comprising branch metric units (521) and ACS units (523) for computing path metrics and the Viterbi detector coupled to a decoder (127) and error correction unit (129). However, the prior art taken singly or in combination fail to teach, anticipate, suggest, or render obvious equalizing the data to a primary target; matching a Viterbi-like detector to the primary target; using the Viterbi-like detector to detect data in the input signal; generating a most likely path corresponding to the data in the input signal; estimating a secondary target having at least one parameter different than the primary target; matching a linear post-processor to one of the primary target and a secondary target; using the linear post-processor to operate on the data and determine at least one most likely error event in the most likely path, generating revised paths based on the at least one most likely error event; computing path paths as function response; and metrics corresponding to each of the revised of the most likely path and the linear selecting one of the revised paths based on the path metrics.

Consequently, claim 108 is allowed over the prior art.

Claims **109-114 and 117-120** which is/are directly or indirectly dependent/s of claim 108 are also allowable over the prior art of record.

Any comment considering necessary by the applicant must be submitted to near than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reason for Allowance".

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US PN: 5,521,945 Knudson, Kelly J.

US PN: 5,689,532 Fitzpatrick, Kelly K.

US PN: 5,588,011 Riggle, C. M.

US PN: 6,735,724 McClellan

5. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Esaw Abraham whose telephone number is (571) 272-3812. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are successful, the examiner's supervisor, Albert DeCady can be reached on (571) 272-3819. The fax phone numbers for the organization where this application or proceeding is assigned (571) 273-8300.

Information regarding the status of an Application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

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may be obtained from either Private PAIR or PUBLIC PAIR. Status information for unpublished applications is available through Private Pair only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Esaw Abraham

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PRIMARY EXAMINER**